REMARKS

The Office Action dated July 14, 2006, has been carefully reviewed and the foregoing amendment and following remarks are made in consequence thereof.

Claims 1-31 are pending in this application. Claims 1-31 stand rejected.

The rejection of Claims 1-6, 8, 14, 18-28, and 31 under 35U.S.C.§102(b) as being anticipated by Townsend et al. (U.S. Pat. No. 6,490,476) "Townsend" is respectfully traversed.

Townsend describes a PET/CT scanner 10 that combines a Siemens Somatom AR.SP spiral CT scanner 12 with a rotating ECAT ART PET scanner 14 for using CT images as a basis for the attenuation correction of PET data in order to reduce the increased statistical noise in the PET image due to the PET transmission scan. The PET/CT scanner 10 includes a PET scanner 14 and a CT scanner 12, both commercially-available, in a physically known relationship one with the other. Each of the X-ray CT scanner 12 and the PET scanner 14 are configured for use with a single patient bed 18 such that a patient may be placed on the bed 18 and moved into position for either or both of an X-ray CT scan and a PET scan. (Col. 12, lines 27-36).

The CT images are used to generate attenuation correction factors. The attenuation correction factors are applied to the PET emission data to correct for attenuation (Col. 13, lines 26-31). The CT scan is acquired before the PET scan, following a sixty (60) minute uptake period after 18 F-FDG activity has been injected into the patient. The CT images are reconstructed on the CT acquisition computer and then transferred to the PET console. The CT images are used to generate the attenuation correction factors. Specifically, the attenuation image at 511 keV is estimated by first using a threshold to separate out the bone component of the CT image, and then using separate scaling factors for the bone and non-bone component. These factors are applied after scatter correction to the PET emission data to correct for attenuation, and the PET images are then reconstructed using a Fourier rebinning technique (FORE) and then independently by the ordered-subset EM (OSEM) iterative reconstruction algorithm (FORE+OSEM).

A hybrid scaling method is used for CT-based attenuation correction. This hybrid scaling method is based on the principal that, over the photon energy range covering both CT

and PET (40 to 511 keV), Compton scattering is the most important physical process for the interaction of photons with matter such as air, water, and soft tissue. For these substances, the mass attenuation coefficient, determined by the linear attenuation coefficient divided by density, is almost the same at each photon energy, and thus the relative change in linear attenuation coefficient between two photon energies is essentially the same. The X-ray beam is polychromatic. Therefore, for the X-ray source in the Somatom, an energy of 70 keV represents a reasonable mean value for an effective beam energy. The change in linear attenuation coefficient from a mean CT energy of 70 keV to the PET energy of 511 keV is approximately 0.53 for air, fat, water, blood, soft tissue, muscle, and lungs. The same scaling factor does not, however, apply to bone because the photoelectric cross-section at CT energies is significantly increased due to the relative abundance of calcium in bone. A separate scaling factor must therefore be introduced for bone and other highly attenuating structures. At 511 keV, the contribution from the photoelectric effect is essentially negligible. All photon interaction in biological tissues, including bone, is dominated by Compton scattering.

The CT images are scaled from 70 keV to 511 keV in three steps. First, the CT image is divided into regions of pixels classified as either non-bone or bone by simple thresholding or more sophisticated segmentation methods. Non-bone classified pixel values are then scaled with a single factor of 0.53, and bone classified pixel values are scaled with a lower scaling factor of 0.44. Finally, attenuation correction factors along oblique LOR's are obtained by forward projection through the segmented and scaled CT images.

Claim 1 recites a method for obtaining data wherein the method includes "scanning at least one of a head of a patient and a neck of the patient with a Multi-Energy Computed Tomography (MECT) system to acquire image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process, the MECT including an x-ray source rotatable about the patient, the MECT configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect."

Townsend does not describe nor suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system as recited in Claim 1. Specifically, Townsend does not describe nor suggest a Multi-Energy Computed Tomography system MECT configured to acquire image data including attenuations from a Compton process and

to acquire image data including attenuations from a photoelectric process. Rather, in contrast to the present invention, Townsend describes a system that scales CT data for attenuation correction of PET data at equivalent PET photon energies, but does not describe nor suggest a Multi-Energy Computed Tomography system MECT configured to acquire image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process. Accordingly, and for at least the reasons set forth above, Claim 1 is submitted to be patentable over Townsend.

Claims 2-6, 8, 14, 18-22 depend from independent Claim 1. When the recitations of Claims 2-6, 8, 14, 18-22 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-6, 8, 14, 18-22 likewise are patentable over Townsend.

Claim 23 recites a Multi-Energy Computed Tomography (MECT) System configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect, the MECT including "a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of a scan of the head; generate an image of at least one of a cerebral blood volume of the patient and a cerebral blood flow of the patient; and calculate a mean transit time of the cerebral blood flow based on the received data.

Townsend does not describe nor suggest a Multi-Energy Computed Tomography (MECT) System as recited in Claim 1. Specifically, Townsend does not describe nor suggest a Multi-Energy Computed Tomography system MECT comprising a computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of a scan of the head; generate an image of at least one of a cerebral blood volume of the patient and a cerebral blood flow of the patient; and calculate a mean transit time of the cerebral blood flow based on the received data. Rather, in contrast to the present invention, Townsend merely mentions that PET images of cerebral flow and metabolism contain a limited amount of low-resolution anatomical information which can be exploited by alignment procedures for registration of PET and CT images, but Townsend does not describe nor suggest generating an image of at least one of a cerebral blood volume of the patient and a cerebral blood flow of the patient or calculating a mean

transit time of the cerebral blood flow based on the received data. Accordingly, and for at least the reasons set forth above, Claim 23 is submitted to be patentable over Townsend.

Claims 24-26 depend from independent Claim 23. When the recitations of Claims 24-26 are considered in combination with the recitations of Claim 23, Applicants submit that dependent Claims 24-26 likewise are patentable over Townsend.

Claim 27 recites a Multi-Energy Computed Tomography (MECT) System configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect, the MECT including "a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of at least one of a head of the patient and a neck of the patient; receive data regarding a second energy spectrum of the scan; and generate a location of a tagging ligand based upon the received data."

Townsend does not describe nor suggest a Multi-Energy Computed Tomography (MECT) system as recited in Claim 27. Specifically, Townsend does not describe nor suggest a Multi-Energy Computed Tomography system including a computer configured to generate a location of a tagging ligand based upon received data regarding a first energy spectrum of a scan of at least one of a head of the patient and a neck of the patient, and received data regarding a second energy spectrum of the scan. Rather, in contrast to the present invention, Townsend describes a system that scales CT data for attenuation correction of PET data at equivalent PET photon energies, but does not describe nor suggest a Multi-Energy Computed Tomography system including a computer configured to generate a location of a tagging ligand based upon received data. Accordingly, and for at least the reasons set forth above, Claim 27 is submitted to be patentable over Townsend.

Claim 28 recites a Multi-Energy Computed Tomography (MECT) System configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect, the MECT including "a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of at least one of a head of the patient and a neck of the patient; receive data regarding a second energy spectrum of the scan; and detect a labeled drug based upon the received data."

Townsend does not describe nor suggest a Multi-Energy Computed Tomography (MECT) system as recited in Claim 28. Specifically, Townsend does not describe nor suggest a Multi-Energy Computed Tomography system configured to detect a labeled drug based upon the received data regarding a first energy spectrum of a scan of at least one of a head of the patient and a neck of the patient and received data regarding a second energy spectrum of the scan. Rather, in contrast to the present invention, Townsend describes a PET/CT system that scales CT data for attenuation correction of PET data at equivalent PET photon energies, but does not describe nor suggest a Multi-Energy Computed Tomography system MECT configured to detect a labeled drug based upon received data regarding a first energy spectrum of a scan and received data regarding a second energy spectrum of the scan. Accordingly, and for at least the reasons set forth above, Claim 28 is submitted to be patentable over Townsend.

Claim 31 recites a Multi-Energy Computed Tomography (MECT) System configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect, the MECT including "a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of the scan; and classify tissue as cancerous and non-cancerous based upon the received data."

Townsend does not describe nor suggest a Multi-Energy Computed Tomography (MECT) system as recited in Claim 31. Specifically, Townsend does not describe nor suggest a Multi-Energy Computed Tomography system configured to classify tissue as cancerous and non-cancerous based upon received data regarding a first energy spectrum of a scan of a head of the patient and received data regarding a second energy spectrum of the scan. Rather, in contrast to the present invention, Townsend merely describes a PET evaluation of a bulky supraglotic and hypopharangeal tumor wherein the PET scan was acquired and demonstrated intense uptake of FDG in the tumor, a soft tissue mass in the upper right neck and in a mass in the left neck and wherein a fused sagittal image localized the intense FDG uptake to the hypopharangeal mass, but Townsend does not describe nor suggest a Multi-Energy Computed Tomography system MECT configured to classify tissue as cancerous and non-cancerous based upon received data regarding a first energy spectrum

and a second energy spectrum of the scan. Accordingly, and for at least the reasons set forth above, Claim 31 is submitted to be patentable over Townsend.

For at least the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1-6, 8, 14, 18-28, and 31 be withdrawn.

The rejection of Claims 15-17, and 29 under 35 U.S.C. § 103(a) as being unpatentable over Townsend in view of Carroll et al. (U.S. Patent No. 6,687,333) "Carroll" is respectfully traversed.

Townsend is described above. Carroll describes a system for generating tunable pulsed monochromatic X-rays that may be used to generate CT-like images using a rotating mosaic crystal "optic" time-of-flight "imaging," and phase contrast images. The system includes a tabletop laser emitting a light beam that is counter-propagated against an electron beam produced by a linear accelerator. X-ray photon pulses are generated by inverse Compton scattering that occurs as a consequence of the "collision" that occurs between the electron beam and IR photons generated by the laser.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection

is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Carroll is cited for describing the use of a CT based system for detecting a labeled drug. Applicants respectfully submit it is not obvious to combine a tabletop laser and a linear accelerator into a device that rotates the source of x-rays and the detector about a patient. There has to be a possibility of success shown in the cited art. Since there is no teaching or suggestion in the cited art for the combination or the possibility of success when combining the art, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit that Townsend and Carroll teach away from each other and the present invention. Townsend describes a system that scales CT data for attenuation correction of PET data at equivalent PET photon energies and Carroll describes a system for generating tunable pulsed monochromatic X-rays. Applicants respectfully submit it would not be obvious to use a method for generating tunable pulsed monochromatic X-rays with a system that simultaneously acquires emission and transmission data using a CZT detector. Accordingly, Applicants submit Townsend and Carroll teach away from each other and the present invention.

Moreover, neither Townsend nor Carroll, considered alone or in combination, describe or suggest the claimed invention. Specifically, Claim 1 recites a method for obtaining data wherein the method includes "scanning at least one of a head of a patient and a neck of the patient with a Multi-Energy Computed Tomography (MECT) system to acquire image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process, the MECT including an x-ray source rotatable about the patient, the MECT configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect."

Neither Townsend nor Carroll, considered alone or in combination, describe or suggest a method for scanning a patient with a Multi-Energy Computed Tomography

(MECT) system as recited in Claim 1. As described above, Townsend does not describe nor suggest a method that includes acquiring image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process and Applicants respectfully submit that Carroll does not make up for the deficiencies of Townsend. Specifically, no combination of Townsend or Carroll, describes or suggests a method for obtaining data wherein the method includes "scanning at least one of a head of a patient and a neck of the patient with a Multi-Energy Computed Tomography (MECT) system to acquire image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process, the MECT including an x-ray source rotatable about the patient, the MECT configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect. Rather, in contrast to the present invention, Townsend describes a system that scales CT data for attenuation correction of PET data at equivalent PET photon energies and Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals. Accordingly, and for at least the reasons set forth above, Claim 1 is submitted to be patentable over Townsend in view of Carroll.

Claims 15-17 depend from independent Claim 1. When the recitations of Claims 15-17 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 15-17 likewise is patentable over Townsend in view of Carroll.

Claim 29 recites a Multi-Energy Computed Tomography (MECT) System configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect, the MECT comprising "a radiation source rotatable about a patient...a radiation detector...a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient...receive data regarding a second energy spectrum of the scan...generate a location of a tagged ligand with an affinity to a neurotransmitter released by a specific labeled drug's receptors based upon the received data...detect a labeled drug based upon the received data to simultaneously monitor the labeled drug's distribution and a concentration of the neurotransmitter."

Neither Townsend nor Carroll, considered alone or in combination, describe or suggest a Multi-Energy Computed Tomography (MECT) system as recited in Claim 29. Specifically, neither Townsend nor Carroll, considered alone or in combination, describe or suggest a Multi-Energy Computed Tomography system configured to detect a labeled drug based upon received data regarding a first energy spectrum of a scan of a head of the patient and received data regarding a second energy spectrum of the scan to simultaneously monitor the labeled drug's distribution and a concentration of a neurotransmitter. Rather, in contrast to the present invention, Townsend describes a PET/CT system that scales CT data for attenuation correction of PET data at equivalent PET photon energies, and Carroll describes a system including a tabletop laser and a linear accelerator with a photocathode injector and RF accelerator and gun and a beam alignment sub-system positioned at a laser beam-electron beam interaction zone that directs the X-ray beam through a beryllium window and onto mosaic crystals. Accordingly, and for at least the reasons set forth above, Claim 29 is submitted to be patentable over Townsend in view of Carroll.

For the reasons set forth above, Applicants request that the Section 103 rejection of Claims 15-17 and 29 be withdrawn.

The rejection of Claims 7, 9-12, 25, 26, and 30 under 35 U.S.C. § 103(a) as being unpatentable over Townsend in view of Fessler (U.S. Patent No. 6,754,298) is respectfully traversed.

Townsend is described above. Fessler describes a reconstruction method for a polyenergetic scan wherein both the spatial and energy dependencies are parameterized using basis functions that do not require separability in the spatial and energy dimensions and yields a system of equations in the line integrals through the spatial basis functions. The equations are solved numerically in sinogram space, and FBP reconstruction is performed to form images of the material components.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both

found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Townsend describes a PET/CT system that scales CT data for attenuation correction of PET data at equivalent PET photon energies and Fessler is merely cited for its teaching of a multi-energy CT system to acquire data and perform a Basis Material Decomposition (BMD) of the acquired data. Since there is no teaching or suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit that Townsend and Fessler teach away from each other and the present invention. Townsend describes a PET/CT system that scales CT data for attenuation correction of PET data at equivalent PET photon energies and Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity. Applicants respectfully submit it would not be obvious to use a method for reconstructing images from transmission measurements having energy diversity with a system that scales CT data for attenuation correction of PET data at equivalent PET photon energies. Accordingly, Applicants submit Townsend and Fessler teach away from each other and the present invention.

Moreover, neither Townsend nor Fessler, considered alone or in combination, describe or suggest the claimed invention. As described above, Townsend does not describe nor suggest a method that includes acquiring image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process and Applicants respectfully submit that Fessler does not make up for the deficiencies of Townsend. More specifically, Claim 1 recites a method for obtaining data wherein the method includes "scanning at least one of a head of a patient and a neck of the patient with a Multi-Energy Computed Tomography (MECT) system to acquire image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process, the MECT including an x-ray source rotatable about the patient, the MECT configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect."

Neither Townsend nor Fessler, considered alone or in combination, describe or suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system as recited in Claim 1. Specifically, no combination of Townsend or Fessler, describes or suggests a method that includes acquiring image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process. Rather, in contrast to the present invention, Townsend describes a PET/CT system that scales CT data for attenuation correction of PET data at equivalent PET photon energies and Fessler describes a method for statistically reconstructing images from a plurality of transmission measurements having energy diversity. Accordingly, and for at least the reasons set forth above, Claim 1 is submitted to be patentable over Townsend in view of Fessler.

Claims 7 and 9-12 depend from independent Claim 1. When the recitations of Claims 7 and 9-12 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 7 and 9-12 likewise is patentable over Townsend in view of Fessler."

Claim 23 recites a Multi-Energy Computed Tomography (MECT) System configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect, the MECT including "a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of a scan of the head; generate an

image of at least one of a cerebral blood volume of the patient and a cerebral blood flow of the patient; and calculate a mean transit time of the cerebral blood flow based on the received data."

Neither Townsend nor Fessler, considered alone or in combination, describe or suggest a Multi-Energy Computed Tomography (MECT) System as recited in Claim 23. Specifically, neither Townsend nor Fessler, considered alone or in combination, describe or suggest a Multi-Energy Computed Tomography system including a computer configured to generate an image of at least one of a cerebral blood volume of the patient and a cerebral blood flow of the patient, and calculate a mean transit time of the cerebral blood flow based on received data regarding a first energy spectrum of a scan of a head of the patient and received data regarding a second energy spectrum of a scan of the head. Rather, in contrast to the present invention, Townsend describes a PET/CT system that scales CT data for attenuation correction of PET data at equivalent PET photon energies and Fessler merely mentions that potential applications of dual-energy imaging have been explored, including carotid artery plaques. Fessler does not indicate whether such explorations have been successful nor does Fessler describe nor suggest a combination with a system that scales CT data for attenuation correction of PET data at equivalent PET photon energies. Accordingly, and for at least the reasons set forth above, Claim 23 is submitted to be patentable over Townsend in view of Fessler.

Claims 25 and 26 depend from independent Claim 23. When the recitations of Claims 25 and 26 are considered in combination with the recitations of Claim 23, Applicants submit that dependent Claims 25 and 26 likewise is patentable over Townsend in view of Fessler.

Claim 30 recites a Multi-Energy Computed Tomography (MECT) System configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect, the MECT comprising: "a radiation source rotatable about a patient; a radiation detector; and a computer coupled to said radiation source and said radiation detector, said computer configured to: receive data regarding a first energy spectrum of a scan of a head of the patient; receive data regarding a second energy spectrum of the scan; and perform a Basis Material Decomposition (BMD) of the received data to characterize a plaque in a carotid artery."

No combination of Townsend and Fessler describes or suggests the combination recited in Claim 30. Specifically, Applicant respectfully submits that no combination of Carroll and Fessler describes or suggests a multi-energy computed tomography system configured to. Rather, in contrast to the present invention, Townsend describes a PET/CT system that scales CT data for attenuation correction of PET data at equivalent PET photon energies and Fessler merely mentions that potential applications of dual-energy imaging have been explored, including carotid artery plaques. Accordingly, and for at least the reasons set forth above, Claim 30 is submitted as patentable over Townsend in view of Fessler.

For the reasons set forth above, Applicants request that the Section 103 rejection of Claims 7, 9-12, 25, 26, and 30 be withdrawn.

The rejection of Claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Townsend in view of Leuchter et al. (U.S. Patent No. 5,269,315) "Leuchter" is respectfully traversed.

Townsend is described above. Leuchter describes a method of analyzing electroencephalographic information to assess brain lesions, characterize afflictions such as dementia, Alzheimer's disease, Pick's disease and demyelinating diseases such as multiple sclerosis using a determination of the electrical output of a brain region by obtaining first data representative of energy in the brain region in a primary frequency domain and determining second data representative of energy in the primary frequency domain relative to the energy in a secondary frequency domain. Notably, Leuchter describes receiving electrical signals from regions of the brain of a subject and does not describe nor suggest a Multi-Energy Computed Tomography (MECT) system or any other type of CT system.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Leuchter is cited for obtaining information pertaining to brain lesions and diseases such as mild dementia and Alzheimer's disease. Leuchter determines brain lesions by quantified electroencephalography and does not describe or suggest using a multi-energy computed tomography system to acquire the data. Since there is no teaching or suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit that Townsend and Leuchter teach away from each other and the present invention. Townsend describes a PET/CT system that scales CT data for attenuation correction of PET data at equivalent PET photon energies and Leuchter determines brain lesions by quantified electroencephalography, which is not an imaging system and does not use an x-ray source or an x-ray detector. Accordingly, Applicants submit Townsend and Leuchter teach away from each other and the present invention.

Moreover, neither Townsend nor Leuchter, considered alone or in combination, describe or suggest the claimed invention. Specifically, Claim 1 recites a method for obtaining data wherein the method includes "scanning at least one of a head of a patient and a neck of the patient with a Multi-Energy Computed Tomography (MECT) system to acquire

image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process, the MECT including an x-ray source rotatable about the patient, the MECT configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect."

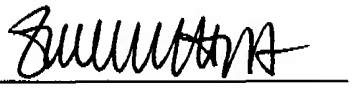
Neither Townsend nor Leuchter, considered alone or in combination, describe or suggest a method for scanning a patient with a Multi-Energy Computed Tomography (MECT) system as recited in Claim 1. As described above, Townsend does not describe nor suggest a method that includes acquiring image data including attenuations from a Compton process and to acquire image data including attenuations from a photoelectric process and Applicants respectfully submit that Carroll does not make up for the deficiencies of Townsend. Specifically, neither Townsend nor Leuchter, describes or suggests a Multi-Energy Computed Tomography system configured to be responsive to different x-ray spectra associated with Compton scatter and photoelectric effect. Rather, in contrast to the present invention, Townsend describes a PET/CT system that scales CT data for attenuation correction of PET data at equivalent PET photon energies and Leuchter describes determining brain lesions by quantified electroencephalography. Accordingly, and for at least the reasons set forth above, Claim 1 is submitted to be patentable over Townsend in view of Leuchter.

Claim 13 depends from independent Claim 1. When the recitations of Claim 13 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claim 13 likewise is patentable over Townsend in view of Leuchter.

For the reasons set forth above, Applicants request that the Section 103 rejection of Claim 13 be withdrawn.

In view of the foregoing remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully requested.

Respectfully Submitted,



William J. Zychlewicz
Registration No. 51,366
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070